

USER'S MANUAL

4MEG VIDEO Model 12 IMAGE MEMORY EXPANSION Version 0.0

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**For use with:
4MEG VIDEO Model 12 Rev.4.2**

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1. Installation

The IMAGE MEMORY EXPANSION board is for use with a 4MEG VIDEO Model 12 revision 4.2 or later revision imaging board. The IMAGE MEMORY EXPANSION will not mount on the 4.0 or 4.1 revisions of the Model 12. The term “4MEG VIDEO” or “Model 12” will be used to refer to the 4MEG VIDEO Model 12.

Reference is made to EPIX’ 4MIP and 4MIPTOOL software. They will be referred to collectively as 4MIP where differentiation is not required.

1.A Unpacking and Static Warning

The IMAGE MEMORY EXPANSION board is packed in a static dissipative bag. Please keep the bag and box in which the board was shipped, should the need arise to package and return the board.

Prior to opening the bag, place the bag near the PC into which the board will be installed. Touching the bag and the PC should dissipate any static charge that may have been created transporting the board to the PC. A static free area for installation is recommended. Alternatively, use a wrist strap that is connected to the PC.

1.B Memory Installation

If the IMAGE MEMORY EXPANSION board was ordered with twelve or fewer SIMMs (Single-In-line Memory Module) installed and more SIMM modules are to be installed, prior to installing additional SIMMs, install and test the boards as received.

The SIMM sockets are numbered 0 thru 15. Socket 0 is the furthest socket from the bracket. Socket 15 is the closest socket to the bracket. SIMMs must be installed in multiples of 4 starting in socket 0. All SIMMs must be the same memory size. SIMMs can be 1Mx8, 1Mx9, 4Mx8, 4Mx9, 16Mx8, or 16Mx9. The ninth bit in a 9 bit wide SIMM is not used.

Place IMAGE MEMORY EXPANSION board on the antistatic shipping bag on a flat surface near the PC. Install a SIMM into the socket by pressing the SIMM firmly into the socket, pushing the SIMM back over the pins at each end of the SIMM, and making sure the metal latches at each end of the socket latch the SIMM in place.

1.C SIMM Size Shunt

A 16 pin DIP shunt labelled “EPIX 1M”, “EPIX 4M”, or “EPIX 16M” is installed in a socket at location SW1 near the non-bracket end of the board. The shunt label must match the amount of memory on the SIMMs that are installed or are to be installed and must match the SIMM size on the label on the chip in location H1 in the lower left corner of the 4MEG VIDEO Model 12. The chip at location H1 is labelled “UDL81x”, “UDL84x”, or “UDL816x” where the number after the “8” designates the SIMM size and “x” designates the revision level of the chip.

1.D Connection to Model 12

A connector-extender printed circuit board with two connectors on each side and four standoff with eight screws attach the IMAGE MEMORY EXPANSION board to the Model 12. The Model 12 must have the image memory board removed prior to the installation of the IMAGE MEMORY EXPANSION board. Plug the connector-extender board onto the Model 12. Mount the 4 standoffs to the Model 12 with the screws provided. Install the

IMAGE MEMORY EXPANSION board on top of the Model 12 by plugging the connectors on the back of the IMAGE MEMORY EXPANSION board into the connector-extender that was previously mounted on the Model 12. Install the 4 screws and tighten all 8 screws.

1.E Installation

Remove the brackets and bracket retaining screws from two adjacent 16 bit slots in the PC bus. Check that there is enough clearance to the slot adjacent to the IMAGE MEMORY EXPANSION board. Extended height SIMMs may require that the slot adjacent to the IMAGE MEMORY EXPANSION board is empty.

Plug the two board assembly into two adjacent slots in the PC bus.

Install the required cables.

Turn on the power to the PC and test the boards by strobing "Run Diagnostics" in the "Obscure Menus" of 4MIP. Note that with 256 MB of memory, the diagnostics may require several hours to complete. Also check that the image memory size reported in the "4MEG VIDEO Configuration" menu matches the amount of memory installed.

1.F SIMM Requirements

Either 8 bit or 9 bit, 30 pin SIMMs are required. For 1 wait state operation with the TMS320C25 on the Model 12, 60 nanosecond access time DRAMs are required. Some 60 nanosecond access time DRAMs do not meet other timing requirements for the Model 12. The following DRAMs have been tested with the Model 12:

1. TMS4164400-60DJ, Texas Instruments
2. HM514100-BS6, Hitachi
3. AAA4M204J-04A, NMB
4. AAA4M204J-06A, NMB
5. 814100H-60, Fujitsu
6. 816100-60, Fujitsu
7. KM41C16000J-6, Samsung

The following DRAMs do NOT meet the timing requirements of the TMS320C25 on the Model 12:

1. M5M416100, Mitsubishi

1.G Power Requirements

The IMAGE MEMORY EXPANSION requires 100 milliamps from the +5 volt power supply in addition to the power required for the 4MEG VIDEO Model 12.

2. Changes to the 4MEG VIDEO Model 12 Memory Offset Register

The IMAGE MEMORY EXPANSION uses only power from the PC bus, however, the PC bus I/O register and the TMS320C25 register that controls the memory on the 4MEG VIDEO Model 12 have been changed to allow up to 16 memory modules to be accessed.

Three sizes of memory modules and twelve configurations of memory are available for the IMAGE MEMORY EXPANSION board. The Model 12 is configured for one of the three sizes of memory modules based on the memory size ordered for the IMAGE MEMORY EXPANSION board. The upper memory offset register of the PC bus and the memory offset register of the TMS320C25 bus are changed for the three sizes of modules as described below.

2.A PC Bus Upper Memory Offset Register

0x283 (PC3). Upper Memory Offset Register (UMO). Read/Write. Undefined at power-up.

For IMAGE MEMORY EXPANSION boards with four, eight, twelve, or sixteen 1MB modules:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Reserved						MS1	MS0

To access more than the first 64K of image memory, the PC uses an 8 bit memory offset register (MO) and 2 module select bits. The MO is shared with the TMS320. The PC can read or write the contents of the LMO or UMO register only when the PC (and not the TMS320) has access to the image memory. The contents of the MO register is added to bits 14 and 15 of the PC address bus to create the upper 8 address bits to the image memory.

Bits MS1 and MS0 select one of four groups of four memory modules. The 2 module select bits are not included in the address addition.

For IMAGE MEMORY EXPANSION boards with four, eight, twelve, or sixteen 4MB modules:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Reserved				MS1	MS0	MO9	MO8

To access more than the first 64K of image memory, the PC uses a 10 bit memory offset register (MO) and 2 module select bits. The two least significant bits of the UMO are concatenated with the eight bits of the LMO to form the 10 bit MO. The MO is shared with the TMS320. The PC can read or write the contents of the LMO or UMO register only when the PC (and not the TMS320) has access to the image memory. The contents of the MO register is added to bits 14 and 15 of the PC address bus to create the upper 10 address bits to the image memory.

Bits MS1 and MS0 select one of four groups of four memory modules. The 2 module select bits are not included in the address addition.

For IMAGE MEMORY EXPANSION boards with four, eight, twelve, or sixteen 16MB modules:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
MS1	MS0	MO13	MO12	MO11	MO10	MO9	MO8

To access more than the first 64K of image memory, the PC uses a 12 bit memory offset register (MO) and 2 module select bits. The 4 least significant bits of the UMO are concatenated with the eight bits of the LMO to form the 12 bit MO. The MO is shared with the TMS320. The PC can read or write the contents of the LMO or UMO register only when the PC (and not the TMS320) has access to the image memory. The contents of the MO register is added to bits 14 and 15 of the PC address bus to create the upper 12 address bits to the image memory.

Bits MS1 and MS0 select one of four groups of four memory modules. The 2 module select bits are not included in the address addition.

2.B TMS320 Memory Offset Register

0x6 (T6) Memory Offset Register. Write/Read. Undefined at power-up.

For IMAGE MEMORY EXPANSION boards with four, eight, twelve, or sixteen 1MB modules:

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Reserved						MS1	MS0	MO7	MO6	MO5	MO4	MO3	MO2	MO1	MO0

The MO register is used by the TMS320 and the PC to access the entire image memory address space. The MO register can be written and read by both the PC and the TMS320. The processor with access to the image memory also has access to the MO register. The MO bits of the MO register are added to bits 15 and 14 of the TMS320C25 address. Bits MS1 and MS0 select one of four groups of four memory modules.

For IMAGE MEMORY EXPANSION boards with four, eight, twelve, or sixteen 4MB modules:

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Reserved				MS1	MS0	MO9	MO8	MO7	MO6	MO5	MO4	MO3	MO2	MO1	MO0

For IMAGE MEMORY EXPANSION boards with four, eight, twelve, or sixteen 16MB modules:

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Reserved		MS1	MS0	MS11	MS10	MO9	MO8	MO7	MO6	MO5	MO4	MO3	MO2	MO1	MO0

3. LIMITED WARRANTY

EPIX, Inc. warrants the 4MEG VIDEO Model 12 and the IMAGE MEMORY EXPANSION to be in good working order for a period of one year from the date of purchase from EPIX or from an authorized EPIX distributor. Should this product fail to be in good working order at any time during the one year warranty period, EPIX will, at its option, repair or replace this product at no additional charge except as set forth below. Repair parts and replacement Products will be furnished on an exchange basis and will be either reconditioned or new. All replaced parts and products become the property of EPIX.

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